A case report of a dyslexic child with an above average IQ, responding to remedial intervention (Dyslexia-Case Report)

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Abstract: Developmental learning disorders are known to cause a great amount of psychological and mental stress to the kids and their parents. They affect lives in an adverse manner. Early diagnosis and the right kind of intervention can help the child attain academic standards on par with their peers as seen in this case.
[Azra Kirmani , Hanan Ahmad Al-Kadi, Rahila Iftikhar and Yusuf Mayat. **A case report of a dyslexic child with an above average IQ, responding to remedial intervention (Dyslexia-Case Report).** *Life Sci J* 2014;11(5):92-96]. (ISSN:1097-8135). http://www.lifesciencesite.com. 12

Keywords: Dyslexia, Early Intervention.

Introduction:

M. J* was born at full term by elective cesarean section into an Indian expatriate family living in Jeddah, Kingdom of Saudi Arabia. She was the second born issue with a 5 and a half year old sibling. All major developmental milestones were achieved on time. The child was able to use two/ three words in a sentence by the age of two. The child was perceived by the parents to possess above normal intelligence. She started attending school (Pre School Group) at the age of 2 years and 4 months. She showed high level of enthusiasm in going to school. However she was reported to be quiet and aloof at school by the teacher. Regression in her verbal communication(1) was noticed by the parents and was attributed to her intense feeling of jealousy towards her new born younger brother who was 2 years younger to her.

Due to her poor performance at school and her reading and writing difficulties and presence of echolalia,(2) M. J had a consultation with a child psychiatrist at the age of 3 years and 9 months. The diagnostic impressions were as follows:

Axis I - (1) Mixed receptive expressive language disorder.

(2) Pervasive development disorder – not otherwise specified.

Axis II - ? Mental retardation vs Borderline IQ.

Axis III - No medical/surgical problems.

Axis IV - No acute stressors

Axis V - Global Assessment of Functioning (GAF) = 70

The child was referred to a school for children with special needs as to better meet her needs.

She attended the special school for about a year. She was dealt with on a 1: 1 basis. Improvement in her level of confidence, and verbal communication was noticed as early as 2 weeks at the school. By the end of four months drastic improvement in her verbal communication, and academics was noticed. She was joined in the mainstream school in KG III (American syllabus) at the age of five. There was no problem encountered during that academic year. The teacher described the child as an excellent student who was co-operative, helpful and enthusiastic. Reading,(3, 4) writing(5) and spelling difficulties surfaced again in grade one. The teacher noticed that though the child was speaking well she had difficulty blending the sounds of letters to make a word.(6-9) This also had consequential impact on her spelling and writing skills. Mirror writing was also noticed.(10) At the age of 6 years and 6 months she was seen by an educational psychologist at the "Cognition and Skills Development Center" in Jeddah. Her cognitive abilities were assessed with the WISC-IV (Wechsler Intelligence Scale for Children—Fourth USA Edition). The results were as follows:

Diagnostic Impression was that her difficulties are typical of a **specific learning difficulty.**

The child was started on remediation based on the recommendations of the above test results and observations.

A follow up assessment of her basic literacy skills using the WIAT-II (Wechsler Individual Achievement Test—second UK edition) at the age of 8 years and 2 months indicated the following:

Subtest	Scaled Score (0-19, average=10)
Block Design	11
Similarities	5
Digit Span	10
Picture Concepts	10
Coding	9
Vocabulary	8
Arithmetic	5
Matrix Reasoning	12
Comprehension	6
Symbol Search	1

Scale	Composite Score	Percentile Rank	95% Confidence Interval
Verbal Comprehension	VCI 79	8	73-87
Perpetual Reasoning	PRI 106	66	98-113
Working Memory	WMI 86	18	79-95
Processing speed	PSI 73	4	67-85
Full Scale	FSIQ 83	13	79-88

Name of the subtest	Standard Score	Age Equivalent
Word Reading	76	6y: 4 months
Spelling	81	6y: 8 months
Reading Comprehension	78	6y: 0 months
Pseudo word Decoding	83	6y: 0 months
Written Expression	102	8y: 0 months

Diagnostic impression was that the child's difficulties are typical of a **specific learning difficulty namely dyslexia.** Remediation sessions were given both at Jeddah and in India where the child spent her summer vacation. An end of the session psychological reassessment was done in India at the age of 8 years and 8 months. The following tests were administered:

1. Standard Progressive Matrices-Plus Version (SPM)
2. The Dyslexia screening Test-Junior (DST-J)
3. NIMHANS Battery for Specific Learning Disability (SLD)

The findings of the above mentioned tests were as follows:

On **Standard Progressive Matrices-Plus Version** the child obtained a raw score of 32 and corresponding standard score of 115 and percentile rank of 84. Her score was higher than or equal to 84% of individuals at her age level. The standard score of 115 falls in the '**high average**' category indicating above average intellectual ability. She is likely to excel in the type of perception and clear thinking necessary to extract meaning out of confusion and ambiguity.(11)

On Dyslexia Screening Test-Junior (DST-J) the overall at 'At Risk Quotient' (ATQ) was 1.3 which is considered a 'Strongly at risk' score. The profile of the child was as follows:

Subtests	Raw Score	At Risk Index
Rapid Naming	69	High Risk
One Minute Reading	10	High Risk
Phonetic Segmentation	8	Normal (No risk)
Two Minute Spelling	10	Mild Risk
Backwards Digit Span	2	Moderate Risk
Nonsense Passage Reading	41	Moderate Risk
One Minute Writing	20	Normal (No risk)
Verbal Fluency	5	Moderate Risk
Semantic Fluency	12	Normal (No risk)
Vocabulary	11	Normal (No risk)

The overall performance was below average. High levels of difficulties (high risk) were found on tests of rapid naming (12) [26] and one minute reading. This indicated problems in organization of verbal system in general and lack of fluency in reading. Moderate levels (Moderate Risk) of difficulties were found on tests of backward digit span, nonsense reading and verbal fluency.(13) [22] This reflected lack of efficiency in the working memory system, over-reliance on rote word learning and a lack of understanding of the regularities of writing system.(14) [35] This also indicated difficulties in memory organization on alphabetical lines. Mild level (Mild Risk) of difficulty was found on task of two minute spelling indicating lack of fluency in spelling. Average performance (Normal, No risk) was found on tasks of phonemic segmentation, one minute reading, semantic fluency and vocabulary. This reflected good fluid intelligence, problem solving and level of attention.

The child was also assessed on NIMHANS battery for Learning Disability- Level 2. Her ability to focus ***attention*** on a task was found to be adequate as measured by letter cancellation task.

Assessment for ***reading skills*** showed deficits in using phonetic cues and pronunciation of multi-syllabic words. Overall ***comprehension skills*** were near age appropriate. There were no deficits in grasping and reproducing oral answers.

Significant deficits were found on the ***spelling*** test with performance being two standards below age

level. Phonetic spellings predominated in the responses with omission of silent letters. On ***copying task*** significant mistakes were found. She wrote disjoined alphabets, *used wrong capitals and took an inordinately long time to finish the task*. These findings suggest ***problems in writing*** and also point to *deficits in sustaining attention* for a long period of time. In the ***expressive writing*** task the child was able to express herself adequately although the material was marked with poor grammar and multiple spelling mistakes.(15)

Arithmetic skills are more or less age appropriate. There were difficulties in graded multiplication, and division. The Bender- Gestalt test revealed no problems with ***visuo - spatial perception*** (16, 17)or motor abilities. Performance on task of ***visual memory (18-21)*** as measured by Benton Visual Retention Test showed adequate retention of visual material. ***Auditory memory*** for familiar and unfamiliar pairs was adequate.(22)

The diagnostic impression based on clinical observation, interview and test results, has been that the child has **Above Average intellectual capacity**.(23-25) Assessment on NIMHANS battery shows ***presence of Specific Learning Disability, Mixed Type.***(26-28)

M.J has been taking remedial sessions on 1:1 basis, 3 to 5 days a week since the age of 6 years 8 months. (29-31) At present she is in grade 4. Her academic performance is on par with her peers. She has made remarkable progress in reading and writing.(32) Spelling(33) is an area where future remedial efforts are to be focused.

Discussion

Early exposure of the dyslexic child to formal reading and writing seems to have caused the child to withdraw.(34, 35) This might have been the reason for the regression in her spoken language and communication skills. A perception of 'Mixed receptive expressive language disorder'/ Pervasive development disorder – not otherwise specified/Mental retardation vs Borderline IQ resulted due to her behavior pattern.(36-38). It is also possible that the early exposure of the dyslexic child to reading and writing led to early identification and early remediation.(39)

The results of the WISC-IV as reported by the educational psychologist indicate that the child was functioning within the 'Low Average' IQ range. The 'Low Average' IQ figures were not to be taken at face value, as they masked her underlying non-verbal strengths. There was a significant difference between her Perceptual (non-verbal) scores and her Verbal scores.(18, 40-42). This indicated that the child tended to perform better when she was solving non-verbal tasks at a predominantly visual level or via using concrete (hands – on) materials.

As was seen in WIAT-II results, the child's written expressions were age appropriate but all the other literacy skills were significantly delayed. This would mean that she had difficulties in decoding and spellings but knew what she wanted to write. It also indicates that it is her reading difficulties which might be affecting her comprehension skills rather than the other way round. The same conclusion was reiterated during assessment with NIMHANS battery for Learning Disability- Level 2. Her overall ***comprehension skills***(43) were near age appropriate and there were no deficits in grasping and reproducing oral answers. In the ***expressive writing*** task the child was able to express herself adequately. ***Arithmetic skills*** were also more or less age appropriate. As the child is bilingual a longer time frame is required for the deeper understanding of the second language structure.(44-46)

Normalising the various standardized tests among the diverse groups and populations of school going kids is warranted.(47) Increased awareness among teachers and health care providers will facilitate early detection and intervention.(48)

Note: WISC IV was normalized on children from the United States.
WIAT – II was normalized on children from the United Kingdom.
SPM-Plus was interpreted using UK norms.
DST-J & NIMHANS SLD BATTERY was interpreted as per Indian norms.
*Real name changed.

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3/5/2014